



STATE OF DELAWARE  
**DEPARTMENT OF TRANSPORTATION**  
800 BAY ROAD  
P.O. Box 778  
DOVER, DELAWARE 19903

JENNIFER COHAN  
SECRETARY

March 15, 2016

Mr. Joe Caloggero  
The Traffic Group, Inc.  
Suite H  
9900 Franklin Square Drive  
Baltimore, MD 21236

Dear Mr. Caloggero:

The enclosed Traffic Operational Analysis (TOA) review letter for the **Camden Square** commercial development (Tax Parcels NM-02-094.12-01-01.00-000, 03.00-000, 04.00-000, 22.00-000, 23.00-000) has been completed under the responsible charge of a registered professional engineer whose firm is authorized to work in the State of Delaware. They have found the TOA to conform to DelDOT's Development Coordination Manual and other accepted practices and procedures for such studies. DelDOT accepts this review letter and concurs with the recommendations. If you have any questions concerning this letter or the enclosed review letter, please contact me at (302) 760-2167.

Sincerely,

Troy Brestel  
Project Engineer

TEB:km

Enclosures

cc with enclosures: Mr. David Kuklish, Bohler Engineering, Inc.  
Mr. L. Aaron Chaffinch, Town of Camden  
Ms. Constance C. Holland, Office of State Planning Coordination  
Mr. Andrew Parker, McCormick Taylor, Inc.  
DelDOT Distribution

## DelDOT Distribution

Ms. Annie Cordo, Deputy Attorney General  
Mr. Robert McCleary, Director, Transportation Solutions (DOTS)  
Mr. Drew Boyce, Director, Planning  
Mr. Mark Luszczyk, Chief Traffic Engineer, Traffic, DOTS  
Mr. Michael Simmons, Assistant Director, Project Development South, DOTS  
Mr. J. Marc Coté, Assistant Director, Development Coordination  
Mr. T. William Brockenbrough, Jr., County Coordinator, Development Coordination  
Mr. Peter Haag, Traffic Studies Manager, Traffic, DOTS  
Mr. Adam Weiser, Safety Engineer, Traffic, DOTS  
Mr. James Satterfield, Regional Group Engineer, Project Development South, DOTS  
Mr. Thomas Banez, Project Manager, Project Development South, DOTS  
Mr. Thomas Felice, Program Manager, Development Coordination  
Mr. David Dooley, Service Development Planner, Delaware Transit Corporation  
Mr. Anthony Aglio, Planning Supervisor, Statewide & Regional Planning  
Ms. Donna Robinson, Administrative Assistant, Statewide & Regional Planning  
Mr. Todd Sammons, Subdivision Engineer, Development Coordination  
Ms. Wendy Polasko, Kent County Subdivision Coordinator, Development Coordination  
Mr. Joshua Schwartz, Subdivision Manager, Development Coordination  
Mr. Claudy Joinville, Project Engineer, Development Coordination



March 14, 2016

Mr. Troy E. Brestel  
Project Engineer  
DelDOT Division of Planning  
P.O. Box 778  
Dover, DE 19903

RE: Agreement No. 1655  
Traffic Impact Study Services  
**Task No. 1 Subtask 12A – Camden Square**

Dear Mr. Brestel:

McCormick Taylor has completed its review of the Traffic Operational Analysis (TOA) for the Camden Square commercial development prepared by The Traffic Group, Inc. (TTG), dated March 17, 2015. This review was assigned as Task Number 1 (Subtask 12A). TTG prepared the report in a manner generally consistent with DelDOT's *Development Coordination Manual*.

Following their submission of the TOA, TTG submitted a Traffic Signal Justification Study (TSJS) dated September 17, 2015, for the intersection of Delaware Route 10 (Kent Road 29) and Rising Sun Road (also Kent Road 29). While DelDOT's Traffic Section reviewed the TSJS without McCormick Taylor's involvement, their findings are included in this review of the TOA.

The TOA evaluates the impacts of the Camden Square commercial development, proposed to be located on the northeast corner of US Route 13 (South DuPont Highway / Kent Road 24) and Delaware Route 10 in the Town of Camden, Kent County, Delaware. The proposed commercial development would include a 13,225 square-foot pharmacy with drive-through window, a 4,835 square-foot convenience store with gas pumps, a 4,590 square-foot fast-food restaurant with a drive through window, and a 6,160 square-foot high-turnover sit-down restaurant. One full-movement signalized access point is proposed along US Route 13 via the addition of an eastern leg to the intersection of US Route 13 and Old North Road (Kent Road 193), and one full-movement signalized access point is proposed along Delaware Route 10 via the addition of a northern leg to the intersection of Delaware Route 10 and Rising Sun Road. Two rights-in-only access points are also proposed, one along northbound US Route 13 just north of Delaware Route 10 and one along westbound Delaware Route 10 just west of Rising Sun Road. Construction is anticipated to be complete by 2016.

Subsequent to submission and initial review of the TOA, and upon further coordination with DelDOT, the developer revised their proposed site access to include only the full-movement access on US Route 13 at Old North Road, the rights-in access on US Route 13, and the rights-in access on Delaware Route 10 west of Rising Sun Road. No other access point is currently proposed on Delaware Route 10.



The land is currently zoned C-2 (Highway Commercial) within a Heritage Zone overlay in the Town of Camden, and the developer does not propose to change the zoning.

DelDOT currently has a number of relevant projects in the study area, including several associated with DelDOT's Hazard Elimination Program (HEP), which has two sites at the intersection of US Route 13 and Delaware Route 10. Site H of the 2012 HEP is the section of the Delaware Route 10 corridor that intersects US Route 13 and extends from 0.10 mile west of South Main Street to 0.02 mile west of Sandy Hill Trail. This site is identified in the 2002, 2008 and 2012 HEP. The second project, which is Site A of the 2006 HEP, is the section of US Route 13 from 0.22 mile north of Webbs Lane to 0.22 mile south of Lochmeath Way. Both of these HEP reports recommended signing and striping improvements, which have since been installed. The 2012 Site H report also recommended additional studies to examine the need for providing a third through lane on northbound and southbound US Route 13.

Following up on the recommendation of the 2012 HEP Site H report for additional studies, the HEP committee recommended an evaluation to determine the need for and appropriate limits of a third travel lane along northbound and southbound US Route 13 from SR 10A/Walnut Shade Road in the Woodside area to Puncheon Run to address the identified safety and capacity deficiencies. Such a study was completed and summarized in a report dated May 28, 2013. Crash and volume data was evaluated from the Sussex/Kent County line to Bay Road, and it was recommended that the installation of a third through lane within the median along northbound and southbound US Route 13 be included in the Capital Transportation Plan (CTP). It was recommended that the project be constructed in two phases, with the first phase from Lochmeath Way to Puncheon Run (2.95 miles), which would include the Delaware Route 10 intersection. Depending on the rate of growth and development activity along the corridor, a second phase could be constructed from SR 10A/Walnut Shade Road to Lochmeath Way (1.71 miles). The first phase is included in the FY 2015-2020 CTP as the *HEP KC, US 13 Lochmeath Way to Puncheon Run Connector Project* with Preliminary Engineering scheduled to begin in FY 2017.

In addition to the evaluation of the US Route 13 corridor described above, other initiatives have identified the need for capacity improvements in the area. In particular, in 2009 the Town of Camden approved the "Camden Bypass Concept – Option B" plan developed by DelDOT and subsequently adopted it as part of the 2013 Amendment to the 2007 Camden Comprehensive Plan. This conceptual improvement option involves the realignment of Delaware Route 10 to cross US Route 13 south of Camden-Wyoming Avenue and the extension of Old North Road to the east to ultimately connect with Delaware Route 10 east of Rising Sun Road. While the schedule for the Camden Bypass project is not set at this time, the site plan for the proposed Camden Square development would need to accommodate the possible future extension of Old North Road east of US Route 13 and through the site for a connection to Delaware Route 10 east of the site.

Another DelDOT project entails a shared-use path from the Gateway Shopping Center (on Delaware Route 10 east of the study area) to Brecknock Park (west of US Route 13 north of the study area). The shared-use path is proposed to run along Delaware Route 10, cross to the west



side of US Route 13 via Old North Road, and run north along Old Camden Road. There are two possible locations for the shared-use path on the lands of the Camden Square development, and the developer would need to accommodate the possible future path through the site. The schedule for final design and construction of this section of the proposed shared-use path is undetermined at this time.

DelDOT's Traffic Section recently completed a statewide Crossover Study for signalized intersections throughout the state to determine whether appropriate signing and pavement markings are installed. The intersection of US Route 13 and Delaware Route 10 is identified in that study for signing and striping improvements, and the developer would be responsible for implementing improvements at that intersection as recommended by the study.

Based on our review of the TOA as submitted, we have the following comments and recommendations:

The following intersections exhibit level of service (LOS) deficiencies without the implementation of physical roadway and/or traffic control improvements:

<i><b>Intersection</b></i>	<i><b>Existing Traffic Control</b></i>	<i><b>Situations for which deficiencies occur</b></i>
Delaware Route 10 & Rising Sun Road / East Site Access	Unsignalized	2014 Existing AM and PM (Case 1); 2016 AM and PM without and with Camden Square (Cases 2, 3 and 4)
US Route 13 & Delaware Route 10	Signalized	2014 Existing AM (Case 1); 2016 AM and PM without and with Camden Square (Cases 2, 3 and 4)

Per the DelDOT TOA Scoping Meeting Minutes, as part of the TOA, a TSJS was required for the intersection of Delaware Route 10 and Rising Sun Road / Proposed East Site Entrance. While the TOA included a signal warrant analysis, DelDOT requires more information in a TSJS. Consequently, as discussed above, TTG later submitted a separate TSJS. The existing intersection is an unsignalized T-intersection with stop control on the northbound Rising Sun Road approach. The signal warrant analysis included in the TOA concluded that the traffic volumes for both existing and proposed conditions meet the necessary warrants for installing a traffic signal at this intersection. Along with converting the intersection to signalized control as proposed by the TOA, a fourth leg would be added to serve as a site entrance. McCormick Taylor conducted a separate signal warrant analysis based on the existing and projected volumes and found that, *based on the volumes alone*, a traffic signal *may* be warranted at this location. However for the reasons described below, a traffic signal is not recommended for the intersection of Delaware Route 10 and Rising Sun Road / Proposed East Site Entrance at this time. The recommendations in this review letter are based on no signal being installed at this proposed site entrance intersection.

The TSJS does not sufficiently address the concerns of DelDOT's Traffic Section. Upon their review of the TSJS, DelDOT's Traffic Section remains concerned about the proximity of the



proposed signal at Rising Sun Road to the existing signal at the intersection of US Route 13 and Delaware Route 10 (located approximately 600 feet apart). The TSJS does not satisfactorily demonstrate that acceptable traffic operations and safety would be achieved between the signalized intersections on Delaware Route 10, particularly related to queuing and weaving maneuvers between the two signals and the right-turn movement from westbound Delaware Route 10 merging onto northbound US Route 13. Further a signalized entrance at this location is inconsistent with the long term plans for this area as part of the Camden Bypass project. Finally, the proposed site will already have a full-movement signalized access (on US Route 13 opposite Old North Road), so all movements to and from the site are accommodated.

As a result of the evaluations by McCormick Taylor and DelDOT's Traffic Section, and following additional coordination between the developer and DelDOT, the site access point originally proposed in the TOA at the intersection of Delaware Route 10 and Rising Sun Road is no longer proposed and will not be constructed.

Therefore, regarding site entrances for the proposed Camden Square development, we currently recommend one signalized full-movement access point on US Route 13, one unsignalized rights-in-only access point on US Route 13, and one unsignalized rights-in only access point on Delaware Route 10. At US Route 13 and Old North Road, a fourth leg should be added to the existing signalized T-intersection. On US Route 13 between Delaware Route 10 and Old North Road, a one-way entrance into the site should be constructed. On Delaware Route 10 between Rising Sun Road and US Route 13, a one-way entrance into the site should be constructed.

The signalized intersection of US Route 13 and Delaware Route 10 exhibits LOS deficiencies during existing and future conditions. In order to achieve acceptable LOS under future conditions with the proposed Camden Square development, atypical assumptions were needed for two analysis parameters (peak hour factor and saturation flow rate). Alternatively, acceptable LOS could be achieved under future conditions if a third through lane were added each way along northbound and southbound US Route 13. We do not recommend that such improvements be implemented by the developer, but they will be incorporated as part of a DelDOT HEP project.

Should the Town of Camden choose to approve the proposed development, the following items should be incorporated into the site design and reflected on the record plan by note or illustration. All applicable agreements (i.e. letter agreements for off-site improvements and traffic signal agreements) should be executed prior to entrance plan approval for the proposed development.

1. Along the US Route 13 site frontage, the developer should provide a bituminous concrete overlay to the existing shoulder, at DelDOT's discretion. DelDOT should analyze the shoulder's pavement section and recommend an overlay thickness to the developer's engineer if necessary. This overlay may extend beyond the site frontage as necessary to address changes in striping associated with entrance construction.

2. Along the Delaware Route 10 site frontage, the developer should provide a bituminous concrete overlay to the existing shoulder and travel lanes, at DelDOT's discretion. DelDOT should analyze the existing lanes' pavement section and recommend an overlay thickness to the developer's engineer if necessary. This overlay may extend beyond the site frontage as necessary to address changes in striping associated with entrance construction.
3. The developer should construct the North Site Entrance along US Route 13 at Old North Road as a new eastern leg to the existing signalized intersection. The proposed configuration of the improved intersection with the new site entrance is shown in the table below.

Approach	Current Configuration	Proposed Configuration
Northbound US Route 13	One left turn lane and two through lanes	One left turn lane, two through lanes and one right-turn lane
Southbound US Route 13	Two through lanes and one right-turn lane	One left-turn lane, two through lanes and one right-turn lane
Eastbound Old North Road	Two left-turn lanes and one right-turn lane *	Two left-turn lanes, one through lane and one right-turn lane *
Westbound North Site Entrance	Approach does not exist	Two left-turn lanes, one through lane and one right-turn lane

\* The eastbound approach currently includes pavement for an additional lane between the rightmost left-turn lane and the right-turn lane, which is currently hatched out with striping. The proposed configuration will require striping changes on this approach, which may also require an overlay.

Initial recommended minimum turn-lane lengths (excluding tapers) of the separate turn lanes are listed below. The developer should coordinate with DelDOT's Subdivision Section to determine final turn-lane lengths during the site plan review process.

Approach	Left-Turn Lane(s)	Right-Turn Lane
Northbound US Route 13	325 feet *	290 feet **
Southbound US Route 13	225 feet ***	240 feet *
Eastbound Old North Road	175 feet *	275 feet *
Westbound North Site Entrance	140 feet ***	190 feet ***

\* indicates existing turn lane length; final length to be determined by DelDOT during site plan review process

\*\* turn lane length based on DelDOT's *Auxiliary Lane Worksheet*

\*\*\* turn lane length based on storage length per queuing analysis



Because construction of the westbound North Site Entrance will likely require closure of the entrance to the adjoining property to the north, the plan for the subject development must include an interconnection to that property for the purpose of providing access.

4. The developer should enter into a traffic signal agreement with DelDOT for the intersection of US Route 13 and Old North Road / North Site Entrance. The agreement will cover signal adjustments required by the physical improvements described in Item No. 3. The agreement should include pedestrian signals, crosswalks, interconnection, and ITS equipment such as CCTV cameras at DelDOT's discretion. One or more other developers may enter into a traffic signal agreement for this intersection as well. The developer should coordinate with DelDOT on the implementation and equitable cost sharing of the traffic signal.
5. The developer should construct the rights-in-only Site Entrance on northbound US Route 13 between Delaware Route 10 and Old North Road. The design of this entrance should include a separate right-turn lane on northbound US Route 13. The details of the exact entrance location and the length of the northbound right-turn lane for this US Route 13 site entrance will be determined by DelDOT during the site plan review process.

To further reinforce that this access point is a one-way entrance only (not an exit from the site onto US Route 13), Do Not Enter signs (MUTCD R5-1) and arrow pavement markings shall be installed and oriented to face potential site exiting traffic along this entrance driveway.

6. The developer should construct the rights-in-only Site Entrance on westbound Delaware Route 10 between Rising Sun Road and US Route 13. The design of this entrance should include a separate right-turn lane on westbound Delaware Route 10. The details of the exact entrance location and the length of the westbound right-turn lane for this Delaware Route 10 site entrance will be determined by DelDOT during the site plan review process.

To further reinforce that this access point is a one-way entrance only (not an exit from the site onto Delaware Route 10), Do Not Enter signs (MUTCD R5-1) and arrow pavement markings shall be installed and oriented to face potential site exiting traffic along this entrance driveway.

7. The developer should improve the intersection of Delaware Route 10 and Rising Sun Road. The proposed configuration is shown in the table below. The improved intersection should remain unsignalized.

Approach	Current Configuration	Proposed Configuration
Northbound Rising Sun Road	One shared left/right-turn lane with concrete channelizing island for right turns	One left-turn lane and one right-turn lane
Eastbound Delaware Route 10	One left (u-turn) lane, two through lanes and one right-turn lane	Two through lanes and one right-turn lane
Westbound Delaware Route 10	One left-turn lane and two through lanes	One left-turn lane and two through lanes

Initial recommended minimum turn-lane lengths (excluding tapers) of the separate turn lanes are listed below. The developer should coordinate with DelDOT's Subdivision Section to determine final turn-lane lengths during the site plan review process.

Approach	Left-Turn Lane	Right-Turn Lane
Northbound Rising Sun Road	425 feet *	N/A
Eastbound Delaware Route 10	N/A	450 feet ***
Westbound Delaware Route 10	350 feet **	N/A

\* turn lane length based on storage length per queuing analysis, with 50-foot minimum; final length to be determined by DelDOT during site plan review process

\*\* indicates existing turn lane length; final length to be determined by DelDOT during site plan review process

\*\*\* turn lane length based on DelDOT's *Auxiliary Lane Worksheet*

The existing eastbound Delaware Route 10 left-turn/u-turn lane at the Rising Sun Road intersection should be removed (hatched out) via the implementation of permanent pavement markings. The proposed northbound Rising Sun Road separate left-turn lane and right-turn lane should be implemented via restriping of the roadway. The existing pavement width at this location is sufficient for both lanes and additional widening/pavement reconstruction is not required. These pavement marking changes should be coordinated with the DelDOT Subdivision Section during the site plan review process.

8. The developer should coordinate with DelDOT regarding refinement of the Camden Square site plan as needed to support the future extension of Old North Road east of US Route 13 and through the site for a connection to Delaware Route 10 east of the site. The extension of Old North Road may occur as part of the proposed "Camden Bypass



Concept – Option B” plan developed by DelDOT and subsequently adopted into the Town of Camden Comprehensive Plan.

9. The following bicycle, pedestrian, and transit improvements should be included:
  - a. A right-turn yield to bikes sign (MUTCD R4-4) should be added at the start of the right-turn lane on northbound US Route 13 at the North Site Entrance, at the start of the right-turn lane on northbound US Route 13 at the rights-in only Site Entrance, and at the start of the right-turn lane on westbound Delaware Route 10 at the rights-in only Site Entrance.
  - b. Adjacent to the right-turn lanes along northbound US Route 13 at the North Site Entrance, along northbound US Route 13 at the rights-in only Site Entrance, and along westbound Delaware Route 10 at the rights-in only Site Entrance, a minimum of a five foot bicycle lane should be dedicated and striped with appropriate markings for bicyclists through the turn lane in order to facilitate safe and unimpeded bicycle travel.
  - c. Appropriate bicycle symbols, directional arrows, striping (including stop bars), and signing should be included along bicycle facilities and right-turn lanes within the project limits.
  - d. Utility covers should be made flush with the pavement.
  - e. Bike parking should be provided near the building entrances within this development. Where the building architecture provides for an awning or other overhang, the bike parking should be covered.
  - f. Along US Route 13, a minimum of a five-foot wide sidewalk that meets current AASHTO and ADA standards should be constructed along the site frontage. The sidewalk should have a minimum of a five-foot buffer from the roadway. At the northern property boundary, the sidewalk should connect to the shoulder of US Route 13 in accordance with DelDOT’s *Shared Use Path and/or Sidewalk Termination Policy* dated June 19, 2014. At the southern property boundary, the sidewalk should connect to the proposed sidewalk along the Delaware Route 10 site frontage.
  - g. Along Delaware Route 10, a minimum of a five-foot wide sidewalk that meets current AASHTO and ADA standards should be constructed along the site frontage. The sidewalk should have a minimum of a five-foot buffer from the roadway. At the eastern property boundary, the sidewalk should connect to the shoulder of Delaware Route 10 in accordance with DelDOT’s *Shared Use Path and/or Sidewalk Termination Policy* dated June 19, 2014. At the western property boundary, the sidewalk should connect to the proposed sidewalk along the US Route 13 site frontage.
  - h. The developer should coordinate with DelDOT regarding refinement of the Camden Square site plan as needed to support a possible future shared-use path through the site as part of a DelDOT project to construct a path from the Gateway Shopping Center to Brecknock Park.
  - i. ADA compliant curb ramps and crosswalks should be provided at all pedestrian crossings, including all site entrances. Type 3 curb ramps are discouraged.



- j. In addition to the site frontage sidewalks described above, internal sidewalks for pedestrian safety and to promote walking as a viable transportation alternative should be constructed within the development. These sidewalks should each be a minimum of five feet wide (with a minimum of a five-foot buffer from the roadway) and should meet current AASHTO and ADA standards. These internal sidewalks should connect the building entrances to the proposed frontage sidewalks and bus stop waiting pads along US Route 13 and Delaware Route 10.
- k. Where internal sidewalks are located alongside of parking spaces, a buffer should be added to eliminate vehicular overhang onto the sidewalk.
- l. The developer should coordinate with the Delaware Transit Corporation (DTC) regarding the possible addition of two ADA-compliant bus stop waiting pads; one at the existing bus stop location along US Route 13 northbound and one along Delaware Route 10 westbound east of the proposed rights-in site access point. The bus stop waiting pads may include amenities such as a shelter, trash receptacle and lighting. Internal sidewalks should be connected to any new transit facilities and parking facilities for bicyclists should be included. The developer should coordinate with the DTC regarding the details and implementation of the transit-related improvements, particularly in relation to future improvements as part of DelDOT's *HEP KC, US 13 Lochmeath Way to Puncheon Run Connector Project* and the Camden Bypass project (noted above in Item No. 8).

Improvements in this TOA may be considered "significant" under DelDOT's *Work Zone Safety and Mobility Procedures and Guidelines*. These guidelines are available on DelDOT's website at [http://www.deldot.gov/information/pubs\\_forms/manuals/de\\_muted/index.shtml](http://www.deldot.gov/information/pubs_forms/manuals/de_muted/index.shtml). For any additional information regarding the work zone impact and mitigation procedures during construction please contact Mr. Adam Weiser of DelDOT's Traffic Section. Mr. Weiser can be reached at (302) 659-4073 or by email at [Adam.Weiser@state.de.us](mailto:Adam.Weiser@state.de.us).

Please note that this review generally focuses on capacity and level of service issues; additional safety and operational issues will be further addressed through DelDOT's subdivision review process.

Additional details on our review of this TOA are attached. Please contact me at (302) 738-0203 or through e-mail at [ajparker@mtmail.biz](mailto:ajparker@mtmail.biz) if you have any questions concerning this review.

Sincerely,

**McCormick Taylor, Inc.**

A handwritten signature in black ink, appearing to read "Andrew J. Parker".

Andrew J. Parker, P.E., PTOE  
Project Manager

Enclosure

*Camden Square*

*March 14, 2016  
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### **General Information**

**Report date:** March 17, 2015

**Prepared by:** The Traffic Group, Inc. (TTG)

**Prepared for:** Dover Square, LLC

**Tax parcel:** NM-02-094.12-01-01.00-000, 03.00-000, 04.00-000, 22.00-000, 23.00-000

**Generally consistent with DelDOT's *Development Coordination Manual*:** Yes

### **Project Description and Background**

**Description:** The proposed commercial development would include a 13,225 square-foot pharmacy with drive-through window, a 4,835 square-foot convenience store with gas pumps, a 4,590 square-foot fast-food restaurant with drive through, and a 6,160 square-foot high-turnover sit-down restaurant.

**Location:** The Camden Square commercial development is proposed to be located on the northeast corner of US Route 13 (South DuPont Highway / Kent Road 24) and Delaware Route 10 (Kent Road 29) in the Town of Camden, Kent County, Delaware. A site location map is included on Page 11.

**Amount of land to be developed:** approximately 29.8 acres

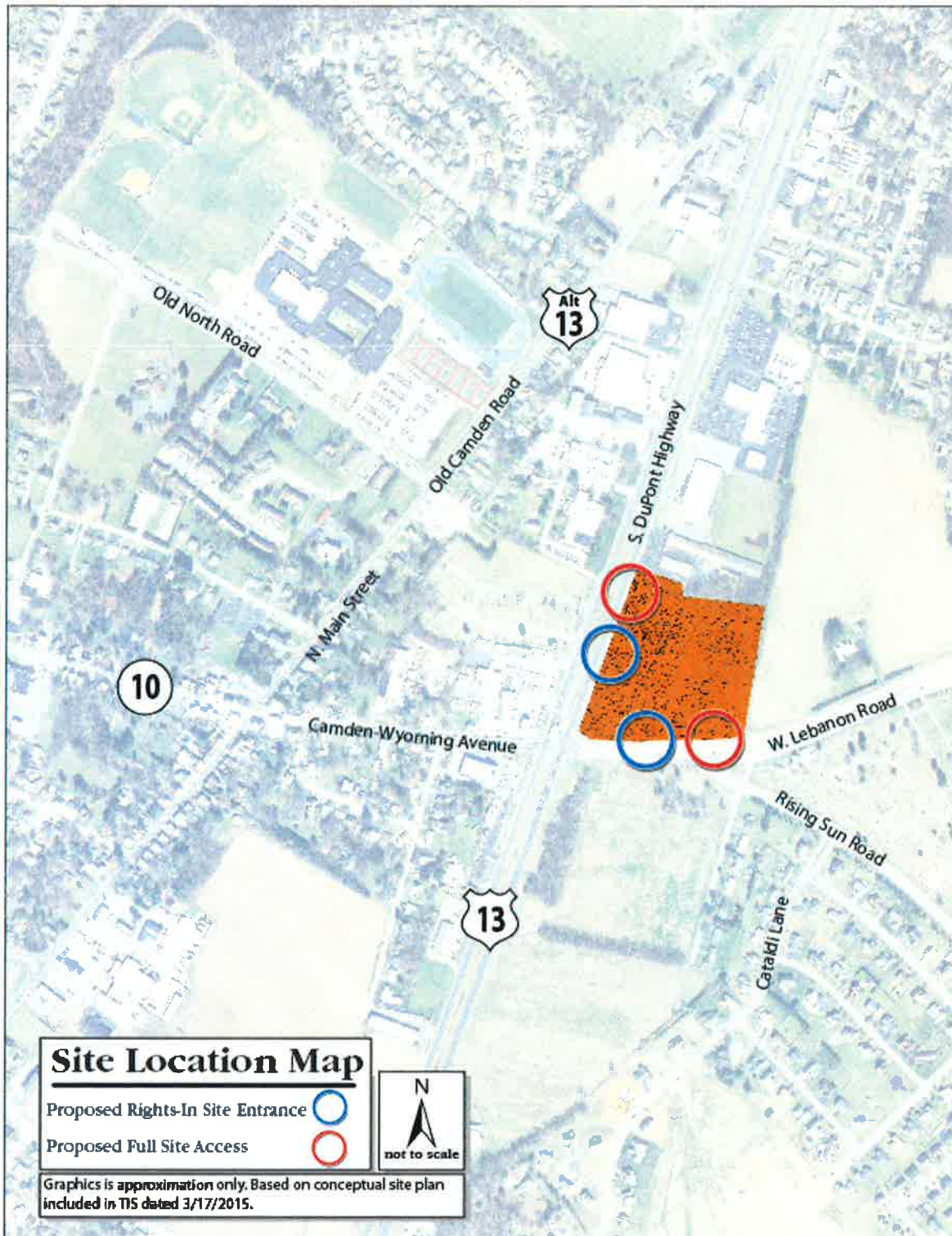
**Land use approval(s) needed:** Subdivision approval. The land is currently zoned C-2 (Highway Commercial) within a Heritage Zone overlay in the Town of Camden, and the developer does not propose to change the zoning.

**Proposed completion date:** 2016

**Proposed access locations:** One full-movement signalized access point is proposed along US Route 13 via the addition of an eastern leg to the intersection of US Route 13 and Old North Road (Kent Road 193), and one full-movement signalized access point is proposed along Delaware Route 10 via the addition of a northern leg to the intersection of Delaware Route 10 and Rising Sun Road (Kent Road 29). Two rights-in-only access points are also proposed, one along northbound US Route 13 just north of Delaware Route 10 and one along westbound Delaware Route 10 just west of Rising Sun Road.

**Daily Traffic Volumes (per DelDOT Traffic Summary 2013):**

- 2013 Average Annual Daily Traffic on US Route 13: 35,909 vpd
- 2013 Average Annual Daily Traffic on DE Route 10: 6,266 vpd



### **Delaware Strategies for State Policies and Spending – 2010 Update**

#### **Location with respect to the Strategies for State Policies and Spending Map of Delaware:**

The proposed Camden Square commercial development is located within an Investment Level 1 area.

#### *Investment Level 1*

Investment Level 1 Areas are areas of the state that are most prepared for growth and where the state can make cost-effective infrastructure investments for schools, roads, and public safety. In these areas, state investments and policies should support and encourage a wide range of uses and densities, promote other transportation options, foster efficient use of existing public and private investments, and enhance community identity and integrity. Investment Level 1 Areas are often municipalities, towns, or urban/urbanizing places in counties. Density is generally higher than in the surrounding areas. Overall, it is the state's intent to use its spending and management tools to maintain and enhance community character, to promote well-designed and efficient new growth, and to facilitate redevelopment in Investment Level 1 Areas.

#### **Proposed Development's Compatibility with Strategies for State Policies and Spending:**

The proposed Camden Square commercial development is located within an Investment Level 1 area, and is to be developed as several pad sites including a drive-thru pharmacy, convenience store with gas pumps, a fast-food restaurant and a high turnover sit-down restaurant. This type of development is consistent with the character of Investment Level 1 areas. The proposed development is located within the Town of Camden along the commercial corridor of US Route 13. The *Strategies* document generally encourages efficient new growth and redevelopment in Investment Level 1 areas, and the proposed development is consistent with those goals. It is therefore concluded that the proposed development generally complies with the policies stated in the 2010 update of the "Strategies for State Policies and Spending."

### **Relevant Projects in the DelDOT Capital Transportation Program**

DelDOT currently has a number of relevant projects in the study area, including several associated with DelDOT's Hazard Elimination Program (HEP), which has two sites at the intersection of US Route 13 and Delaware Route 10. Site H of the 2012 HEP is the section of the Delaware Route 10 corridor that intersects US Route 13 and extends from 0.10 mile west of South Main Street to 0.02 mile west of Sandy Hill Trail. This site is identified in the 2002, 2008 and 2012 HEP. The second project, which is Site A of the 2006 HEP, is the section of US Route 13 from 0.22 mile north of Webbs Lane to 0.22 mile south of Lochmeath Way. Both of these HEP reports recommended signing and striping improvements, which have since been installed. The 2012 Site H report also recommended additional studies to examine the need for providing a third through lane on northbound and southbound US Route 13.

Following up on the recommendation of the 2012 HEP Site H report for additional studies, the HEP committee recommended an evaluation to determine the need for and appropriate limits of a third travel lane along northbound and southbound US Route 13 from SR 10A/Walnut Shade Road in the Woodside area to Puncheon Run to address the identified safety and capacity

deficiencies. Such a study was completed and summarized in a report dated May 28, 2013. Crash and volume data was evaluated from the Sussex/Kent County line to Bay Road, and it was recommended that the installation of a third through lane within the median along northbound and southbound US Route 13 be included in the Capital Transportation Plan (CTP). It was recommended that the project be constructed in two phases, with the first phase from Lochmeath Way to Puncheon Run (2.95 miles), which would include the Delaware Route 10 intersection. Depending on the rate of growth and development activity along the corridor, a second phase could be constructed from SR 10A/Walnut Shade Road to Lochmeath Way (1.71 miles). The first phase is included in the FY 2015-2020 CTP as the *HEP KC, US 13 Lochmeath Way to Puncheon Run Connector Project* with Preliminary Engineering scheduled to begin in FY 2017.

In addition to the evaluation of the US Route 13 corridor described above, other initiatives have identified the need for capacity improvements in the area. In particular, in 2009 the Town of Camden approved the “Camden Bypass Concept – Option B” plan developed by DelDOT and subsequently adopted it as part of the 2013 Amendment to the 2007 Camden Comprehensive Plan. This conceptual improvement option involves the realignment of Delaware Route 10 to cross US Route 13 south of Camden-Wyoming Avenue and the extension of Old North Road to the east to ultimately connect with Delaware Route 10 east of Rising Sun Road. While the schedule for the Camden Bypass project is not set at this time, the site plan for the proposed Camden Square development would need to accommodate the possible future extension of Old North Road east of US Route 13 and through the site for a connection to Delaware Route 10 east of the site.

Another DelDOT project entails a shared-use path from the Gateway Shopping Center (on Delaware Route 10 east of the study area) to Brecknock Park (west of US Route 13 north of the study area). The shared-use path is proposed to run along Delaware Route 10, cross to the west side of US Route 13 via Old North Road, and run north along Old Camden Road. There are two possible locations for the shared-use path on the lands of the Camden Square development, and the developer would need to accommodate the possible future path through the site. The schedule for final design and construction of this section of the proposed shared-use path is undetermined at this time.

DelDOT’s Traffic Section recently completed a statewide Crossover Study for signalized intersections throughout the state to determine whether appropriate signing and pavement markings are installed. The intersection of US Route 13 and Delaware Route 10 is identified in that study for signing and striping improvements, and the developer would be responsible for implementing improvements at that intersection as recommended by the study.

### **Trip Generation**

Trip generation for the proposed development was computed using comparable land uses and equations contained in Trip Generation, Ninth Edition, published by the Institute of Transportation Engineers (ITE). The following land uses were utilized to estimate the amount of new traffic generated for this development:

- Pharmacy/Drugstore with Drive-Through Window (ITE Land Use Code 881)
- Convenience Market with Gasoline Pumps (ITE Land Use Code 853)
- Fast-Food Restaurant with Drive-Through Window (ITE Land Use Code 934)
- High Turnover (Sit-Down) Restaurant (ITE Land Use Code 932)

Table 1  
CAMDEN SQUARE PEAK HOUR TRIP GENERATION

Land Use	Weekday AM Peak Hour			Weekday PM Peak Hour		
	In	Out	Total	In	Out	Total
13,225 SF Pharmacy w/ Drive Thru	24	22	46	65	66	131
Pass-by Trips (PM 49%)	0	0	0	-32	-32	-64
<b>Net Pharmacy Trips</b>	<b>24</b>	<b>24</b>	<b>46</b>	<b>33</b>	<b>34</b>	<b>67</b>
4,835 SF Convenience Market w/ Gas Pumps	99	99	198	114	114	228
Pass-by Trips (AM 63%, PM 66%)	-62	-62	-124	-75	-75	-150
<b>Net Conv. Market w/ Gas Pumps Trips</b>	<b>37</b>	<b>37</b>	<b>74</b>	<b>39</b>	<b>39</b>	<b>78</b>
4,590 SF Fast Food Restaurant w/ Drive Thru	106	102	208	78	72	150
Pass-by Trips (AM 49%, PM 50%)	-52	-50	-102	-39	-36	-75
<b>Net Fast Food Restaurant Trips</b>	<b>54</b>	<b>52</b>	<b>106</b>	<b>39</b>	<b>36</b>	<b>75</b>
6,160 SF High Turnover (Sit-Down) Restaurant	37	30	67	37	24	61
Pass-by Trips (PM 43%)	0	0	0	-16	-10	-26
<b>Net High Turnover Restaurant Trips</b>	<b>37</b>	<b>30</b>	<b>67</b>	<b>21</b>	<b>14</b>	<b>35</b>
Total Pass-by Trips	114	112	226	162	153	315
<b>TOTAL TRIPS</b>	<b>152</b>	<b>143</b>	<b>295</b>	<b>132</b>	<b>123</b>	<b>255</b>

Table 2  
CAMDEN SQUARE DAILY TRIP GENERATION

Land Use	Weekday ADT		
	In	Out	Total
13,225 SF Pharmacy w/ Drive Thru	641	641	1282
4,835 SF Convenience Market w/ Gas Pumps	3256	3256	6512
4,590 SF Fast Food Restaurant w/ Drive Thru	1139	1139	2278
6,160 SF High Turnover (Sit-Down) Restaurant	392	392	784
<b>TOTAL TRIPS</b>	<b>5428</b>	<b>5428</b>	<b>10856</b>

### **Overview of TOA**

#### **Intersections examined:**

- 1) US Route 13 & Old North Road / North Site Access
- 2) Delaware Route 10 & Rising Sun Road / East Site Access
- 3) US Route 13 & Delaware Route 10
- 4) Old Camden Road / Main Street (Kent Road 4) & Old North Road \*
- 5) Delaware Route 10 & Main Street \*
- 6) US Route 13 and northbound rights-in-only site entrance (Case 4 only)
- 7) Delaware Route 10 and westbound rights-in-only site entrance (Case 4 only)

\* These two intersections are required to be evaluated in the TOA, but DelDOT does not require the developer to make any improvements at these two intersections.

#### **Conditions examined:**

- 1) 2014 existing conditions (Case 1)
- 2) 2016 without Camden Square (Case 2)
- 3) 2016 with Camden Square and no rights-in-only access points (Case 3)
- 4) 2016 with Camden Square and with rights-in-only access points (Case 4)

**Peak hours evaluated:** Weekday morning and evening peak hours

#### **Committed developments considered:**

- 1) Tidbury Crossing (101 single-family detached houses and 150 townhouses; currently fully built and occupied except for 6 townhouse units)
- 2) Longacre Village (135 single-family detached houses, 81 townhouses, and 84 apartment units; 41 townhouses and all 84 apartment units unbuilt)
- 3) Brookfield (105 single-family detached houses; all unbuilt)

**Intersection Descriptions**

**1) US Route 13 & Old North Road / North Site Access**

**Type of Control:** existing signalized three-leg intersection; proposed signalized four-leg intersection

**Northbound approach:** (US Route 13) existing one left-turn lane and two through lanes; proposed one left-turn lane, two through lanes and one right-turn lane

**Southbound approach:** (US Route 13) existing two through lanes and one right-turn lane; proposed one left-turn lane, two through lanes and one right-turn lane

**Eastbound approach:** (Old North Road) existing two left-turn lanes and one right-turn lane; proposed two left-turn lanes, one through lane and one right-turn lane

**Westbound approach:** (North Site Access) proposed two left-turn lanes, one through lane and one right-turn lane

**2) Delaware Route 10 & Rising Sun Road / East Site Access**

**Type of Control:** existing two-way stop-controlled (three-leg intersection); proposed signalized four-leg intersection

**Northbound approach:** (Rising Sun Road) existing one shared left/right-turn lane; proposed one left-turn lane and one shared through/right-turn lane

**Southbound approach:** (East Site Access) proposed one left-turn lane and one shared through/right-turn

**Eastbound approach:** (DE Route 10) existing one left (u-turn) lane, two through lanes and one right-turn lane; proposed one left-turn lane, two through lanes and one right-turn lane

**Westbound approach:** (DE Route 10) existing one left-turn lane and two through lanes; proposed one left-turn lane, two through lanes and one right-turn lane

**3) US Route 13 & Delaware Route 10**

**Type of Control:** signalized four-leg intersection

**Northbound approach:** (US Route 13) one left-turn lane, two through lanes and one free right-turn lane

**Southbound approach:** (US Route 13) two left-turn lanes, two through lanes and one right-turn lane

**Eastbound approach:** (DE Route 10) one left-turn lane, two through lanes, and one right-turn lane

**Westbound approach:** (DE Route 10) two left-turn lanes, one through lane, and one free right-turn lane

- 4) **Old Camden Road / Main Street & Old North Road**  
**Type of Control:** signalized four-leg intersection  
**Northbound approach:** (Main Street) one shared through/left-turn lane and one right-turn lane  
**Southbound approach:** (Old Camden Road) one shared through/left-turn lane and one right-turn lane  
**Eastbound approach:** (Old North Road) one left-turn lane and one shared through/right-turn lane  
**Westbound approach:** (Old North Road) one left-turn lane and one shared through/right-turn lane
  
- 5) **Delaware Route 10 & Main Street**  
**Type of Control:** signalized four-leg intersection  
**Northbound approach:** (Main Street) one shared through/left/right-turn lane  
**Southbound approach:** (Main Street) one shared through/left/right-turn lane  
**Eastbound approach:** (DE Route 10) one shared through/left/right-turn lane  
**Westbound approach:** (DE Route 10) one shared through/left/right-turn lane
  
- 6) **US Route 13 & Rights-In-Only Site Entrance**  
**Type of Control:** proposed rights-in-only T-intersection  
**Northbound approach:** (US Route 13) one left-turn lane for downstream Old North Road intersection, two through lanes and one proposed right-turn lane  
**Southbound approach:** (US Route 13) two through lanes, separated from northbound lanes by grass median  
**Note:** This site entrance is proposed as a one-way street heading away from US Route 13. This intersection would consist only of northbound through and right-turning traffic, and no HCS analysis is conducted for this type of intersection.
  
- 7) **Delaware Route 10 & Rights-In-Only Site Entrance**  
**Type of Control:** proposed rights-in-only T-intersection  
**Eastbound approach:** (DE Route 10) two through lanes and one right-turn lane for downstream Rising Sun Road intersection, separated from westbound lanes by concrete median  
**Westbound approach:** (DE Route 10) two left-turn lanes for downstream US Route 13 intersection, two through lanes and one right-turn lane  
**Note:** This site entrance is proposed as a one-way street heading away from DE Route 10. This intersection would consist only of westbound through and right-turning traffic, and no HCS analysis is conducted for this type of intersection.

### **Safety Evaluation**

**Crash Data:** Crash data was obtained from the 2012 HEP Report for Site H which includes Delaware Route 10 from 0.10 mile west of South Main Street to 0.02 mile west of Sandy Hill Trail. This covers all of the intersections on Delaware Route 10 that were included in this TOA. The crash data comprises a four-year study period from January 1, 2008 to December 31, 2011

along the aforementioned corridor. During the study period, a total of 171 crashes were reported, including 31 personal injury crashes and one fatal crash that resulted in two fatalities at the intersection of Delaware Route 10 and Main Street. There were two pedestrian crashes resulting in pedestrian injury and six crashes which involved alcohol. The data indicates that the most common types of crashes were rear-end crashes (70%) and angle crashes (15%). Most of the crashes occurred during daylight hours (74%) and with dry surface conditions (82%). Most crashes were a result of driver inattention, distraction and fatigue, or following too close. The high percentage of rear-end crashes are typical of arterial corridors with traffic signals. A breakdown of crashes by intersection is listed below:

- US Route 13 and Delaware Route 10
  - 115 crashes reported. The most common crash situations were 26 westbound right-turn rear-end crashes, 23 northbound rear-end crashes, 21 westbound rear-end crashes and 17 southbound rear-end crashes. Note that the current intersection configuration is different than the configuration that existed during the time period covered by this crash data. The high number of westbound right-turn crashes was associated with a yield-controlled condition for westbound traffic turning right onto northbound US Route 13 (no acceleration lane provided). After 2011, that yield condition was modified to include an acceleration lane approximately 200 feet in length.
- Delaware Route 10 and Main Street
  - 23 crashes reported. Most common situations: 5 eastbound rear-end crashes, 5 westbound rear-end crashes, 3 northbound rear-end crashes, 2 southbound rear-end crashes, and 1 fatal angle/errant vehicle crash resulting in 2 fatalities.
- Delaware Route 10 and Rising Sun Road
  - 7 crashes reported. Most common situations: 3 northbound left-turn/westbound through angle crashes and 2 northbound rear-end crashes (1 within median opening).

**Sight Distance:** With generally straight and flat roadways, and few potential visual obstructions, sight distance is largely adequate throughout the study area. One potential sight distance issue was observed in the field at the future site access at Delaware Route 10 and Rising Sun Road where southbound vehicles coming from the site would have limited sight distance looking left (to the east) along Delaware Route 10 due to the horizontal curvature of the roadway. Another location with limited sight distance is the intersection of Delaware Route 10 and Main Street, where existing buildings are located close to the street on all four corners, thereby affecting intersection sight distance. DelDOT will not require the developer to make any improvements at this intersection due to resulting impacts on these surrounding buildings. Otherwise, no problematic sight distance issues have been reported or indicated by crash data, and no major problems were observed during field observations in the area.

### **Transit, Pedestrian, and Bicycle Facilities**

**Existing transit service:** The Delaware Transit Corporation (DTC) currently operates three DART Bus Routes in the project area. Route 104 (Camden Walmart) runs between the Dover Transit Center and the Camden Walmart via US Route 13 with a loop through downtown Camden. DART Route 106 (Dover Air Force Base) also runs between the Dover Transit Center and the Camden Walmart, but runs along Bay Road and Delaware Route 10. Inter-County Route

303 (Dover-Georgetown) runs between the Dover Transit Center and the Georgetown Transit Hub in Sussex County. This route runs along US Route 13 and Delaware Route 10 in the project area. There is an existing signed bus stop and a small concrete pad without connecting sidewalks for DART Routes 104 and 303 at the proposed site frontage along US Route 13 northbound just south of Old North Road.

**Planned transit service:** DTC has requested that 5' x 8' ADA compliant bus stop waiting pads be provided at the existing bus stop location along US Route 13 northbound and along Delaware Route 10 westbound, just east of the proposed site access at Rising Sun Road. The proposed bus stop waiting pads should connect to ADA compliant sidewalks along the proposed site frontage.

**Existing bicycle and pedestrian facilities:** According to DelDOT's Kent County Bicycle Map (dated 2011), US Route 13 along the site frontage is classified as a Connector Bicycle Route with a bikeway that contains high traffic and is challenging for cyclists. Delaware Route 10 is classified as a high-traffic Regional Bicycle Route with a bikeway along the proposed site frontage. Currently, US Route 13 and Delaware Route 10 both have wide shoulders but do not contain designated bicycle lanes, signing, or striping. There are no shoulders for bicyclists near the intersection approaches at US Route 13 and Delaware Route 10 due to the presence of auxiliary lanes, and dedicated bicycle lanes have not been striped between the through and right-turn lanes. According to the bicycle level of service (BLOS) calculator developed by the *League of Illinois Bicyclists*, the US Route 13 and Delaware Route 10 corridors both operate at BLOS A.

There are currently no sidewalks or pedestrian facilities in either direction of US Route 13 or Delaware Route 10 along the site frontage. There are no pedestrian signals or crosswalks at the signalized intersection of US Route 13 and Delaware Route 10, or the unsignalized intersection of Delaware Route 10 and Rising Sun Road. The newly constructed segment of Old North Road between South Main Street and US Route 13 contains buffered sidewalks in each direction, and there is a marked crosswalk across the western leg of the intersection of US Route 13 and Old North Road with pedestrian signals. There are existing sidewalks along both directions of Delaware Route 10 from Delaware Route 15 to US Route 13 (west of US Route 13), which terminate at the intersection with US Route 13.

**Planned bicycle and pedestrian facilities:** The TOA did not include any correspondence with DelDOT's Statewide and Regional Planning Section regarding planned or requested bicycle and pedestrian facilities in the area of this proposed development. McCormick Taylor contacted Mr. Anthony Aglio and Ms. Sarah Coakley from DelDOT's Planning Section but did not receive a response. Based on the existing land use, existing pedestrian facilities and requested transit accommodations, the following pedestrian improvements should be considered:

- Construct buffered ADA-compliant sidewalks along the entire site frontage along US Route 13 and Delaware Route 10, with connections to the requested bus stop waiting pads
- Construct internal ADA-compliant buffered sidewalks, which should connect to proposed sidewalks along the US Route 13 and Delaware Route 10 site frontages.
- Provide bike racks at each of the pad sites.

- Provide a pedestrian crossing with pedestrian signals across the proposed eastern leg of the US Route 13 & Old North Road / North Site Access intersection.
- Coordinate with DelDOT regarding possible crosswalk with pedestrian signals across US Route 13 in the vicinity of the site, in conjunction with DelDOT's future project to construct a shared-use path from the Gateway Shopping Center to Brecknock Park.
- Install designated bicycle lanes and signage adjacent to all right-turn lanes into the proposed site.

### **Previous Comments**

All comments from DelDOT's Scoping Letter, Traffic Count Review, and Preliminary TOA (PTOA) Review were addressed in the Final TOA submission, with the following exception:

- There were no indications that the applicant contacted the Delaware Transit Corporation (DTC) for transit-related comments.
- There were no indications that the applicant contacted DelDOT's Statewide and Regional Planning Section for bicycle and pedestrian-related comments.
- There were no indications that the applicant contacted DelDOT regarding the shared-use path project or the Traffic Section Crossover Study referenced in the Scoping Letter.

### **General HCS Analysis Comments**

*(see table footnotes on the following pages for specific comments)*

- 1) For the unsignalized intersection of Delaware Route 10 and Rising Sun Road, the TOA and McCormick Taylor applied heavy vehicle factors (HV) by movement using existing data. For signalized intersections, McCormick Taylor applied HV by lane group using existing data. For the two proposed signalized site entrances, HV was applied by lane group using existing data or 3%, whichever is greater. The HCS worksheets provided in the TOA do not specify how HV percentages were applied.
- 2) For existing conditions, the TOA and McCormick Taylor determined, for each intersection, overall intersection peak hour factors (PHF). For future conditions, the TOA and McCormick Taylor generally assumed existing PHF for all intersections unless otherwise noted. McCormick Taylor assumed a PHF of 0.92 for the two proposed signalized site entrances since new legs, movements and additional volumes were added to each intersection.
- 3) For signalized intersections, McCormick Taylor used a base saturation flow rate of 1,750 pcphpl per DelDOT's Development Coordination Manual. The developer did not note the base saturation flow rates used in their analysis, either in the letter or the capacity analysis appendix.
- 4) McCormick Taylor conservatively input no right-turn-on-red (RTOR) volumes for existing and future conditions analyses. The developer did not note whether RTOR volumes were used in their analysis, either in the letter or the capacity analysis appendix.

- 5) The HCS analyses included in the TIS did not always reflect the lane widths observed in the field by McCormick Taylor. McCormick Taylor's HCS analyses incorporated our field-measured lane widths.
- 6) The TIS and McCormick Taylor used different signal timings when analyzing the signalized intersections in some cases.

Table 3  
PEAK HOUR LEVELS OF SERVICE (LOS)  
*based on Traffic Operational Analysis for Camden Square Commercial Development*  
*Report dated March 17, 2015*  
Prepared by The Traffic Group, Inc.

Signalized Intersection <sup>1</sup>	LOS per TOA		LOS per McCormick Taylor	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
<b>US Route 13 &amp; Old North Road / North Site Access <sup>2</sup></b>				
2014 Existing (Case 1)	B (11.4)	B (12.4)	C (23.9)	C (23.2)
2016 without Camden Square (Case 2)	B (10.4)	B (13.1)	C (25.1)	C (24.2)
2016 with Camden Square and No Rights-In Access Points (Case 3) <sup>3</sup>	D (38.9)	C (28.1)	D (40.5)	D (39.6)
2016 with Camden Square and No Rights-In Access Points (Case 3) <sup>3</sup> With Rights-In / Rights-Out East Site Access	N/A	N/A	D (42.3)	D (40.0)
2016 with Camden Square and with Rights-In Access Points (Case 4) <sup>3</sup>	D (39.2)	C (28.2)	D (40.9)	D (39.9)

<sup>1</sup> The numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

<sup>2</sup> The TOA assumed protected-permitted left turns from US 13 and split-phasing for the minor streets. Based on DelDOT-provided signal timings/standard practice and field observations, McCormick Taylor assumed protected-only left turns from US 13 and concurrent phasing for the minor streets.

<sup>3</sup> For Case 3 and Case 4, the TOA assumed PHF = 0.92 for the AM peak hour and assumed the existing PHF = 0.97 for the PM peak hour. McCormick Taylor used PHF = 0.92 for both scenarios since a new leg and additional movements were added to the intersection.

Table 4A  
PEAK HOUR LEVELS OF SERVICE (LOS)  
based on Traffic Operational Analysis for Camden Square Commercial Development  
Report dated March 17, 2015  
Prepared by The Traffic Group, Inc.

Unsignalized Intersection <sup>4</sup> Two-Way Stop Control	LOS per TOA		LOS per McCormick Taylor	
Delaware Route 10 & Rising Sun Road / East Site Access <sup>5</sup>	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2014 Existing (Case 1)				
Westbound DE 10 – Left	A (8.9)	A (9.6)	A (9.7)	A (9.7)
Northbound Rising Sun Road	F (73.9)	E (39.0)	F (83.8)	E (42.3)
2016 without Camden Square (Case 2)				
Westbound DE 10 – Left	A (8.9)	A (9.6)	A (9.7)	A (9.7)
Northbound Rising Sun Road	F (79.9)	E (40.8)	F (90.4)	E (45.4)
2016 with Camden Square and No Rights-In Access Points (Case 3)				
Eastbound DE 10 – Left	A (8.5)	A (9.1)	A (8.4)	A (9.0)
Westbound DE 10 – Left	A (8.9)	A (9.6)	A (9.7)	A (9.6)
Northbound Rising Sun Road	F (216.2)	F (125.6)	F (260.0) <sup>6</sup>	F (160.3) <sup>7</sup>
Southbound Site Access	C (18.9)	D (27.3)	C (19.6)	D (30.9)
2016 with Camden Square and No Rights-In Access Points (Case 3) With Rights-In / Rights-Out at Site Access				
Westbound DE 10 – Left	N/A	N/A	A (10.0-)	A (9.9)
Northbound Rising Sun Road	N/A	N/A	F (161.7) <sup>8</sup>	F (89.1) <sup>9</sup>
Southbound Site Access – Right	N/A	N/A	A (9.6)	B (10.1)

<sup>4</sup> The numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

<sup>5</sup> The TOA analyzed northbound Rising Sun Road with a separate left-turn lane and right-turn lane for Case 1 and 2, and assumed a separate left-turn lane and shared through/right-turn lane for Case 3 and 4. McCormick Taylor analyzed northbound Rising Sun Road with a single shared left/right-turn lane for Case 1 and 2 and shared left/through/right-turn lane for Case 3 and 4.

<sup>6</sup> The 95<sup>th</sup> percentile queue length for the northbound approach is approximately 22 vehicles during the Case 3 AM peak hour.

<sup>7</sup> The 95<sup>th</sup> percentile queue length for the northbound approach is approximately 11 vehicles during the Case 3 PM peak hour.

<sup>8</sup> The 95<sup>th</sup> percentile queue length for the northbound approach is approximately 17 vehicles during the Case 3 AM peak hour with a RIRO East Site Entrance. This analysis assumes separate left and right-turn lanes on the northbound approach.

<sup>9</sup> The 95<sup>th</sup> percentile queue length for the northbound approach is approximately 8 vehicles during the Case 3 PM peak hour with a RIRO East Site Entrance. This analysis assumes separate left and right-turn lanes on the northbound approach.

Table 4B  
PEAK HOUR LEVELS OF SERVICE (LOS)  
based on Traffic Operational Analysis for Camden Square Commercial Development  
Report dated March 17, 2015  
Prepared by The Traffic Group, Inc.

Unsignalized Intersection <sup>10</sup> Two-Way Stop Control	LOS per TOA		LOS per McCormick Taylor	
Delaware Route 10 & Rising Sun Road / East Site Access <sup>11</sup>	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2016 with Camden Square and with Rights-In Access Points (Case 4)				
Eastbound DE 10 – Left	A (8.5)	A (9.1)	A (8.4)	A (9.0)
Westbound DE 10 – Left	A (8.9)	A (9.6)	A (9.7)	A (9.6)
Northbound Rising Sun Road	F (191.7)	F (133.7)	F (274.6) <sup>12</sup>	F (170.4) <sup>13</sup>
Southbound Site Access	C (17.8)	D (28.6)	C (20.3)	D (32.5)

<sup>10</sup> The numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

<sup>11</sup> The TOA analyzed northbound Rising Sun Road with a separate left-turn lane and right-turn lane for Case 1 and 2, and assumed a separate left-turn lane and shared through/right-turn lane for Case 3 and 4. McCormick Taylor analyzed northbound Rising Sun Road with a single shared left/right-turn lane for Case 1 and 2 and shared left/through/right-turn lane for Case 3 and 4.

<sup>12</sup> The 95<sup>th</sup> percentile queue length for the northbound approach is approximately 22 vehicles during the Case 4 AM peak hour.

<sup>13</sup> The 95<sup>th</sup> percentile queue length for the northbound approach is approximately 11 vehicles during the Case 4 PM peak hour.

Table 4C  
PEAK HOUR LEVELS OF SERVICE (LOS)  
based on Traffic Operational Analysis for Camden Square Commercial Development  
Report dated March 17, 2015  
Prepared by The Traffic Group, Inc.

Signalized Intersection <sup>14</sup>	LOS per TOA		LOS per McCormick Taylor	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
<b>Delaware Route 10 &amp; Rising Sun Road / East Site Access</b> <sup>15 16</sup>				
2016 with Camden Square and No Rights-In Access Points (Case 3)	C (22.8)	B (18.5)	C (24.1) <sup>17</sup>	C (21.6) <sup>18</sup>
2016 with Camden Square and with Rights-In Access Points (Case 4)	C (22.9)	B (18.6)	C (24.2) <sup>17</sup>	C (21.7) <sup>18</sup>

<sup>14</sup> The numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

<sup>15</sup> The TOA analyzed northbound Rising Sun Road with a separate left-turn lane and right-turn lane for Case 1 and 2, and assumed a separate left-turn lane and shared through/right-turn lane for Case 3 and 4. McCormick Taylor analyzed northbound Rising Sun Road with a single shared left/right-turn lane for Case 1 and 2 and shared left/through/right-turn lane for Case 3 and 4.

<sup>16</sup> The TOA assumed protected-permitted left turns from EB and WB DE Route 10. McCormick Taylor assumed protected-only left turns from EB and WB DE Route 10.

<sup>17</sup> The 95<sup>th</sup> percentile queue length for the northbound approach is approximately 8 vehicles during the Case 3 and Case 4 AM peak hour.

<sup>18</sup> The 95<sup>th</sup> percentile queue length for the northbound approach is approximately 5 vehicles during the Case 3 and Case 4 PM peak hour.

Table 5A  
PEAK HOUR LEVELS OF SERVICE (LOS)  
based on Traffic Operational Analysis for Camden Square Commercial Development  
Report dated March 17, 2015  
Prepared by The Traffic Group, Inc.

Signalized Intersection <sup>19</sup>	LOS per TOA <sup>20</sup>		LOS per McCormick Taylor <sup>21</sup>	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
<b>US Route 13 &amp; Delaware Route 10</b> <sup>22</sup>				
2014 Existing (Case 1)	D (53.5)	D (44.8)	E (60.2)	D (54.5)
2016 without Camden Square (Case 2)	D (50.8)	D (50.3)	E (65.7)	E (59.0)
2016 with Camden Square and No Rights-In Access Points (Case 3)	D (54.2)	D (52.0)	E (68.7)	E (60.7)
2016 with Camden Square and No Rights-In Access Points (Case 3) <i>adjusted SFR and PHF</i> <sup>23</sup>	N/A	N/A	D (54.8)	D (54.6)
2016 with Camden Square and No Rights-In Access Points (Case 3) <i>with Improvement Option 1</i> <sup>24</sup>	N/A	N/A	D (53.5)	D (48.7)

<sup>19</sup> The numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

<sup>20</sup> For the AM peak hour, the TOA used the existing AM PHF of 0.87 for Case 1 and used the default PHF of 0.92 for Cases 2, 3 and 4. For the PM peak hour, the TOA used the existing PM PHF of 0.98 for all Cases.

<sup>21</sup> McCormick Taylor used the existing AM PHF (0.87) and existing PM PHF (0.98) for all Cases.

<sup>22</sup> For Cases 1, 2 and 3, the TOA and McCormick Taylor removed the northbound right-turn volume and westbound right-turn volume since they are free movements with acceleration lanes. For Case 4, McCormick Taylor added the westbound right turn volume into the analysis but that movement would be yield controlled with no acceleration lane since a westbound free right turn with an acceleration lane on northbound US Route 13 may not be feasible with the installation of a rights-in-only site access point on US Route 13.

<sup>23</sup> This scenario consists of adjustments to the AM Peak Hour Factor (PHF) and the Saturation Flow Rate (SFR). The AM PHF is 0.92 (instead of 0.87) and the SFR for the northbound and southbound US Route 13 through movements is 1,900 pcphpl (instead of 1,750 pcphpl).

<sup>24</sup> Improvement Option 1 includes a third through lane in both directions of US Route 13.

Table 5B  
PEAK HOUR LEVELS OF SERVICE (LOS)  
based on Traffic Operational Analysis for Camden Square Commercial Development  
Report dated March 17, 2015  
Prepared by The Traffic Group, Inc.

Signalized Intersection <sup>25</sup>	LOS per TOA <sup>26</sup>		LOS per McCormick Taylor <sup>27</sup>	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
<b>US Route 13 &amp; DE Route 10</b> <sup>28</sup>				
2016 with Camden Square and with Rights-In Access Points (Case 4)	N/A	N/A	F (97.9)	E (60.4)
2016 with Camden Square and with Rights-In Access Points (Case 4) with Improvement Option 1 <sup>29</sup>	N/A	N/A	E (76.1)	D (49.0)
2016 with Camden Square and with Rights-In Access Points (Case 4) with Improvement Option 2 <sup>30</sup>	D (54.2)	D (52.0)	E (68.7)	E (60.7)
2016 with Camden Square and with Rights-In Access Points (Case 4) with Improvement Option 2 and adjusted SFR and PHF <sup>31</sup>	N/A	N/A	D (54.8)	D (54.6)
2016 with Camden Square and with Rights-In Access Points (Case 4) with Improvement Option 3 <sup>32</sup>	N/A	N/A	D (53.5)	D (48.7)

<sup>25</sup> The numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

<sup>26</sup> For the AM peak hour, the TOA used the existing AM PHF of 0.87 for Case 1 and used the default PHF of 0.92 for Case 2, 3 and 4. For the PM peak hour, the TOA used the existing PM PHF of 0.98 for all Cases.

<sup>27</sup> McCormick Taylor used the existing AM PHF (0.87) and existing PM PHF (0.98) for all Cases.

<sup>28</sup> For Cases 1, 2 and 3, the TOA and McCormick Taylor removed the northbound right-turn volume and westbound right-turn volume since they are free movements with acceleration lanes. For Case 4, McCormick Taylor added the westbound right turn volume into the analysis but that movement would be yield controlled with no acceleration lane since a westbound free right turn with an acceleration lane on northbound US Route 13 may not be feasible with the installation of a rights-in-only site access point on US Route 13.

<sup>29</sup> Improvement Option 1 includes a third through lane in both directions of US Route 13.

<sup>30</sup> Improvement Option 2 assumes the westbound right-turn movement could operate as a free right turn with an acceleration lane on northbound US Route 13. However, providing the acceleration lane for westbound right turns while allowing the rights-in-only site access (which would need a separate deceleration lane) approximately only 400 feet north of Delaware Route 10 would create a potentially unsafe weave condition.

<sup>31</sup> This scenario includes Improvement Option 2 as described above along with adjustments to the AM Peak Hour Factor (PHF) and the Saturation Flow Rate (SFR). The AM PHF is 0.92 (instead of 0.87) and the SFR for the northbound and southbound US Route 13 through movements is 1,900 pcphpl (instead of 1,750 pcphpl).

<sup>32</sup> Improvement Option 3 assumes Improvement Option 1 plus Improvement Option 2.

Table 6  
PEAK HOUR LEVELS OF SERVICE (LOS)  
*based on Traffic Operational Analysis for Camden Square Commercial Development*  
*Report dated March 17, 2015*  
Prepared by The Traffic Group, Inc.

Signalized Intersection <sup>33</sup>	LOS per TOA <sup>34</sup>		LOS per McCormick Taylor <sup>35</sup>	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
<b>Old Camden Road / Main Street &amp; Old North Road</b>				
2014 Existing (Case 1)	C (27.4)	C (20.5)	C (24.2)	B (16.3)
2016 without Camden Square (Case 2)	C (24.2)	C (20.8)	C (24.9)	B (16.4)
2016 with Camden Square (Cases 3 and 4)	C (24.7)	C (21.3)	C (26.3)	B (16.7)

<sup>33</sup> The numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

<sup>34</sup> For the AM peak hour, the TOA used the existing AM PHF of 0.83 for Case 1 and used the default PHF of 0.92 for Case 2, 3 and 4. For the PM peak hour, the TOA used the existing AM PHF of 0.83 for PM Cases 1, 2, 3 and 4.

<sup>35</sup> McCormick Taylor used the existing AM PHF (0.83) and existing PM PHF (0.95) for all Cases.

Table 7  
PEAK HOUR LEVELS OF SERVICE (LOS)  
based on Traffic Operational Analysis for Camden Square Commercial Development  
Report dated March 17, 2015  
Prepared by The Traffic Group, Inc.

Signalized Intersection <sup>36</sup>	LOS per TOA <sup>37</sup>		LOS per McCormick Taylor	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
DE Route 10 & Main Street				
2014 Existing (Case 1)	C (26.2)	D (35.2)	B (11.2)	B (11.1)
2016 without Camden Square (Case 2)	C (26.9)	D (36.4)	B (11.4)	B (11.3)
2016 with Camden Square (Cases 3 and 4)	C (28.2)	D (37.8)	B (11.7)	B (11.6)

<sup>36</sup> The numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

<sup>37</sup> The TOA included an extra phase with no vehicular movements in their analysis. McCormick Taylor did not add this extra phase. The count data shows low pedestrian volumes and there is not an exclusive pedestrian phase, so it is unknown why the TOA included the extra phase.